The Moderating Effect of Hope on the Association between Incidental Negative News Exposure on Social Media and Well-being

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Abstract

Background and rationale: Research on the effects of incidental negative news exposure on social media is scarce, however, the chances of accidentally encountering news on social media are high. Therefore, the aim of the present study was to investigate to what extent incidental negative news exposure affects well-being, while also introducing a moderating variable of hope to this relationship. The purpose was to examine whether hope moderates the relationship between incidental negative news exposure and well-being.

Methods: This study experimentally tested whether exposure to an artificial Instagram feed with and without negative news posts about climate change elicited changes in well-being. A total of 211 participants were randomly assigned to either the control condition (n = 105) or experimental condition (n = 106). Participants in the experimental condition were incidentally exposed to news posts containing negative content. Well-being was measured pre-and post-exposure using the MHC-SF and a modified version of the PCQ-24 hope subscale was used to assess levels of hope.

Results: Results from the paired sample t-test indicated a statistically significant decline in well-being across both groups, but a larger decline was observed in the experimental group. A second analysis using Hayes' PROCESS macro for SPSS revealed no statistically significant association between incidental negative news exposure and well-being. Moreover, hope had no moderating effect on the original relationship.

Discussion and conclusion: This is one of the first studies addressing the incidental aspect of negative news exposure on social media and its impact on well-being. The conflicting findings and the absence of a moderating effect led to new questions. Consequently, limitations were outlined and suggestions were discussed.

Keywords: incidental negative news exposure, social media, well-being, hope

Introduction

Social media platforms currently count 4.48 billion active users, which is roughly half of the world's population (Dean, 2021). Social media has become an increasingly popular source of information through which people stay informed about each other's lives and daily (global) events (Ahmadi & Wohn, 2018; Ozbay & Alatas, 2020). Individuals, as well as communities, interact and communicate with each other by posting, sharing, and liking posts on these platforms (Yamamoto & Morey, 2019). The algorithms behind these actions facilitate the fast distribution and circulation of news on social media (Feezell et al., 2021). For instance, trending posts with a growing number of likes and shares usually jump up to the top of someone's feed (Newberry, 2022). These mechanisms essentially underlie the difference between modern news delivery methods and traditional news delivery methods such as newspapers and television news programs (Feezell et al., 2021). Importantly, as the number of active social media users keeps increasing, news in this way can easily be encountered without any prior intention to find it (Boyd, 2010; Dean, 2021). The idea that people unintentionally can get exposed to news is called incidental news exposure (Tewksbury et al., 2001). Factors related to the scalability of the content and the general social nature of social media can further enhance the distribution and circulation of news on social media, hence, increasing incidental news exposure (Yamamoto & Morey, 2019). Thus, this type of engagement increases the chances of accidentally encountering news (Yamamoto & Morey, 2019). These findings also raise questions about the consequences of these changes in news delivery.

Despite the lack of research addressing the incidental aspect of news exposure on social media, there is increasing evidence for the negative effects of news exposure, especially, in the light of negative news (Bodas et al., 2015; Jain, 2021; Johnston & Davey, 1997; McIntyre & Gibson, 2016). Generally, people are more prone to direct their attention to

negative information, remember it for longer, and feel more emotionally disturbed by it compared to similar neutral or positive information (Baumeister et al., 2001). This tendency is defined as the negativity bias and has been shown to impact one's psychological and emotional state (Soroka & McAdams, 2015). Moreover, existing studies have provided evidence for the negative consequences of negative news exposure on well-being (Bodas et al., 2015; Jain, 2021; Johnston & Davey, 1997; McIntyre & Gibson, 2016). For instance, negative news has been linked to reduced perceived well-being and lowered positive affect (McIntyre & Gibson, 2016). In addition, Johnston and Davey (1997) proposed that overall psychological health may deteriorate through induced worries, and anxious and sad moods evoked by negative news on television programs. Similarly, a study conducted by Bodas et al. (2015) demonstrated a decline in emotional and mental well-being in individuals who were exposed to televised news about war. Another recent study examined the effects of news exposure during the COVID-19 pandemic (Jain, 2021). Increased news consumption predicted reduced overall well-being due to higher levels of stress and lower levels of life satisfaction, gratitude, and happiness. This relationship was moderated by higher levels of interest in COVID-19-related news (Jain, 2021). This supports the idea of the negative impact of incidental exposure as people who are more interested and presumably more likely to actively search for news are less negatively affected by negative news exposure than people who are not interested in the news. Thus, negative news circulating on social media could potentially have a negative impact on its users.

Negative news can be filled with information about a diverse range of topics. For example, negative news can contain information about global crises, political conflicts, wars, and climate change (Hase et al., 2020). In particular, exposure to news concerning climate change can have a negative impact on viewers (Cianconi et al., 2020). Scholars have argued that climate change is currently one of the most enduring threats to humans and their

psychological and physical state (Cianconi et al., 2020). However, people do not necessarily have to be directly involved in environmental events such as floods, wildfires, heat waves, etc. to experience negative consequences. Prior research has shown that exposure to news regarding climate change can also evoke feelings of uncertainty and powerlessness (Cianconi et al., 2020). Furthermore, news about climate change has been associated with problems ranging from decreased well-being and increased stress to exacerbation of depression and anxiety complaints (Cianconi et al., 2020; Palinkas & Wong, 2020). These problems are linked to a person's mental health. According to the World Health Organization (WHO, 2018), mental health can be defined as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community". As shown by prior research, this state of well-being can be disturbed by exposure to news containing negative information (Bodas et al., 2015; Cianconi et al., 2020; Jain, 2021; Johnston & Davey, 1997; McIntyre & Gibson, 2016; Palinkas & Wong, 2020).

Nonetheless, certain traits could potentially minimize this negative effect of negative news exposure on well-being (Hellman et al., 2014; Magaletta & Oliver, 1999). For instance, some evidence suggests that hope is associated with higher levels of well-being (Hellman et al., 2014; Magaletta & Oliver, 1999). According to Snyder (2002), hope is a cognitive ability that aids in finding alternative and creative ways to solve problems and reach goals. Hopeful people have been found to be more satisfied with life, are better able to effectively cope with stressful situations, and are more capable of regulating their emotions (Hellman et al., 2014). Furthermore, hope has been associated with an overall better functioning, with hopeful people experiencing better physical, psychological, and social well-being than people with lower levels of hope (Magaletta & Oliver, 1999). In addition, individuals with high hope have been found to experience more positive and less negative affect (Hellman et al., 2014). Given these

findings, hope may be beneficial in situations where people are exposed to disturbing news. By applying the cognitive skills related to hope, the negative state of well-being caused by incidental negative news exposure might be minimized due to the ability to effectively cope with stressful factors (Hellman et al., 2014). Consequently, hope may moderate the association between incidental negative news exposure and well-being, by facilitating hopeful thinking, hence, lowering the negative impact. While prior research has recognized the direct link between incidental negative news exposure and well-being, there is still a lack of research focusing on a possible moderating effect on this relationship (Jain, 2021).

Therefore, the aim of the current study is to examine whether hope has a moderating effect on the relationship between incidental negative news exposure and well-being (see Figure 1). More precisely, the current study focuses on the research question: "To what extent is the relationship between incidental negative news exposure on social media and well-being moderated by hope?". Furthermore, earlier studies examining the relationship between negative news exposure and well-being have mainly focused on traditional news delivery methods such as television news programs. Therefore, it is of interest to explore this relationship in the light of more modern news delivery methods such as social media platforms. Based on this, the other research question that will be focused on is: "To what extent does incidental negative news exposure on social media influence levels of well-being?".

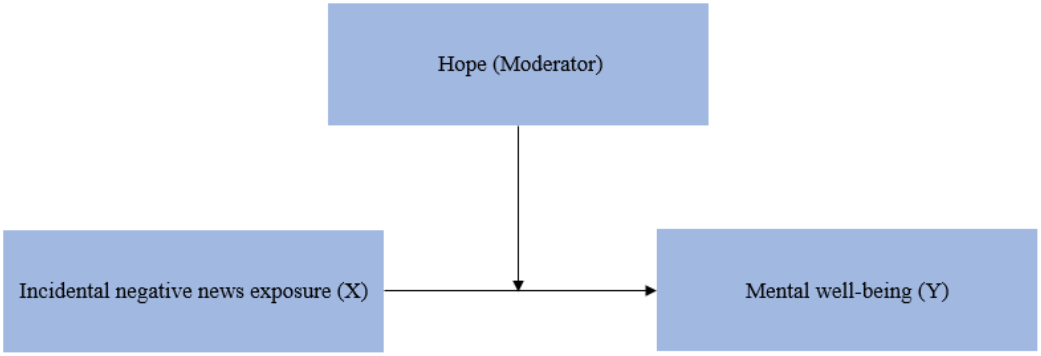
In line with the two research questions the following hypotheses will be tested:

H1: Incidental negative news exposure on social media leads to lower levels of well-being compared to social media exposure without incidental negative news.

H2: Hope moderates the relationship between incidental negative news exposure and well-being.

Figure 1

The Moderating Effect of Hope on the Relationship between Incidental Negative News Exposure and Well-being



Methods

Design

This randomized control trial employed a pre-and-post and between-subjects design. In total, there were two conditions, one experimental condition, in which participants were incidentally exposed to negative news, and one control condition, in which participants were subjected to neutral stimuli. The independent variable was incidental negative news exposure, the dependent variable was well-being, and the moderating variable was hope. This study has been ethically approved by the BMS faculty of the University of Twente with the request number 220301.

Participants

Convenience sampling was used. Participants were recruited through the SONA system of the University of Twente. The SONA system is an online environment in which students can sign up to participate in scientific research of other students in return for mandatory subject hour points, which are required for the completion of their study. Additionally, acquaintances and friends from the researchers were contacted in real life or via WhatsApp and asked to participate and share the study with others. Lastly, the researchers posted a link to the survey on the social media platforms Instagram and Reddit. The latter was used as it is a convenient way to attract participants. On Reddit, there are communities where people can upload questionnaires for free and users can voluntarily fill these questionnaires out. In addition, recruiting participants through Instagram could facilitate familiarity with the stimuli among participants. Regular Instagram users are more likely to recognize the layout of the Instagram feed, hence, making it easier for them to orient through the design used in this study. Furthermore, a prerequisite for participation in the study was the minimum age of 18 years, to ensure that the participants themselves can give their consent. Since the study was in

English, another requirement was sufficient English competency in order to understand the questions.

Materials

Qualtrics.com was used as a platform for administering the questionnaire. Firstly, the participants agreed to an informed consent before taking part in the survey (see Appendix A). The main part of the survey included demographic questions regarding the participants' age, gender, and nationality (see Appendix B). Following that, the items of the Mental Health Continuum Short Form (MHC-SF) and a modified version of the hope subscale from the Psychological Capital Questionnaire (PCQ-24) were displayed to the participant (see Appendix C). Thereafter, an Instagram feed was embedded into Qualtrics, followed by the MHC-SF again. The questionnaires can be found in Appendix D, Appendix E, and Appendix F.

The survey also included two control questions: the first one was displayed before the debriefing, asking the participant to summarize the content of the Instagram feed they had just seen (see Appendix F). The second control question was displayed at the end of the survey after the debriefing. It was asked whether the participants had guessed the true nature of the study before seeing the debriefing form (see Appendix G). At the end of the survey, the participants received a debriefing form (see Appendix G). Appendix A to G can be combined to represent the exact layout of the Qualtrics survey used in this study. Appendix D displays the Instagram feed the control group was exposed to and Appendix E displays the one shown to the experimental group.

Instagram Feed

Participants in both groups were exposed to an artificial Instagram feed. The choice for an Instagram layout was to stay consistent with the sample population. Participants were

recruited through the SONA system of the University of Twente, implying that the study would mainly be attracted by young undergraduate students. In addition, the social circle of the researchers mainly consists of young adults and some middle-aged adults. Given that Instagram is particularly popular among this younger generation, an Instagram design was chosen as a basis for the survey (Statista Research Department, 2022). Another reason why Instagram was chosen is that it has been less associated with active information-seeking compared to social media platforms such as Facebook and Twitter (Voorveld et al., 2018). Instagram users are more likely to use Instagram for entertainment purposes, whereas Facebook and Twitter users turn to these platforms to acquire information and stay up-to-date (Voorveld et al., 2018). Thus, the Instagram design could facilitate the incidental aspect of the social media experience as people do not have any intention to find news on it.

In total, four fake Instagram profiles were created by the research group. For this purpose, copyright-free images from the website “Unsplash” were used (Unsplash, n.d.). The accounts represented two female and two male young fictional characters. The posts concerned topics such as travelling, fashion, fitness, lifestyle, and photography. The choice of content was based on the most popular hashtags on Instagram in 2019, e.g. fashion, fitness, travel, and photography (Rabe, 2022). Two posts of each profile were combined in order to create a realistic Instagram feed (see Appendix D and E).

Regarding the control condition, ten screenshots of neutral Instagram posts uploaded by the fake accounts were chosen. In order to create an experimental condition in which the participants experience incidental exposure to negative news, two posts from the British news company “The Guardian” about catastrophic natural events due to the climate crisis were added to the fictional Instagram feed (The Guardian, 2021a; The Guardian, 2021b). The first post shows a picture of wildfires and refers to the emergency to take action to prevent the climate crisis and the other one shows people suffering from floods (see Appendix E). These

posts were chosen due to The Guardian's status as a high-quality newspaper, as well as the graphic nature of the pictures which show burning forests and people submerged in brown water after a flood. The choice for two disturbing images was to ensure a measurable effect. A study conducted by Palumbo et al. (2021) showed that repeated exposure is associated with better memory and better processing of the stimulus. Consequently, this could ensure that participants become more conscious of the negative news posts and remember them during the remaining part of the study. In terms of the positioning of the posts, the first screenshot was placed as the 4th image to immerse the participant into a neutral feed before incidental exposure takes place and to prevent a too obvious confrontation with the news posts. The second screenshot was placed at the end of the feed to make use of a potential recency effect. The recency effect describes a cognitive bias that information which was received last can be remembered better than information one was exposed to before (Logie, 2003). Accordingly, the effect of incidental negative news exposure on well-being might be better measurable.

Mental Health Continuum Short Form (MHC-SF)

The well-being of the participants was measured using the Mental Health Continuum-Short Form (MHC-SF). It consists of 14 items and measures emotional, psychological, and social well-being, which represent the three dimensions of mental health (Lamers et al., 2011). The participants rated the prevalence of their feelings experienced in the last month on a six-point Likert scale ranging from 0 = *"Never"* to 5 = *"Every Day"* (Lamers et al., 2011). An example question is: "In the past month, how often do you feel interested in life?". The total internal reliability is high (α = .89), and the test-retest reliability is moderate (Lamers et al., 2011). Similarly, the Cronbach's alpha in this study was excellent for both pre-assessment (α = .90) and post-assessment (α = .91). Furthermore, the constructs measured by the MHC-SF have been validated in representative samples of multiple countries (Lamers et al., 2011).

Psychological Capital Questionnaire (PCQ-24) - Hope subscale

The participants' levels of hope were assessed with a six-item subscale of the Psychological Capital Questionnaire (PCQ-24) (Luthans et al., 2007). The PCQ-24 is a 24-item self-report questionnaire that evaluates the four key components of Psychological Capital (PsyCap) as defined by Luthans et al. (2007). The four components are self-efficacy, hope, resilience, and optimism (Luthans et al., 2007). All 24 items were included in the research as the data were used as input for parallel research studies. The items in the original questionnaire are framed to measure PsyCap in an organizational context. However, as the current study investigates PsyCap in a broader context, most of the items had to be rephrased. More precisely, 22 of the 24 items were modified to specifically target the intended constructs and context. For example, the statement, "Right now I see myself as being pretty successful at work", was changed to, "Right now I see myself as being pretty successful in life" (see Appendix H). Items 1 and 9 were not changed as a response as both items fitted within the study's context. The items were measured by means of a six-point Likert scale, with the answer options ranging from 1 = *"Strongly disagree"* to 6 = *"Strongly agree"* (Cid et al., 2020). Moreover, evidence has been found for good criterion validity and discriminant validity (Luthans et al., 2007). In terms of reliability, the original subscale displays good internal reliability, with a Cronbach's alpha of .87 (Liran & Miller, 2019). Furthermore, after modifying the items, the hope subscale displayed good internal reliability ($\alpha = .84$) and excellent overall reliability ($\alpha = .91$) was found for the PCQ-24.

Procedure

The research was conducted through the online platform Qualtrics, and it took approximately 15 minutes to fill in the survey. First, the participants were provided with an informed consent they needed to agree on in order to participate in the study (see Appendix A). In the consent form, it was clarified that all data would be processed anonymously, and

that participation was entirely voluntary and could be stopped at any time. To keep the news exposure incidental, the informed consent form omitted the fact that negative news would be shown. This has been approved by the ethical committee of the University of Twente since it was a necessary aspect to measure incidental negative news exposure. Instead, it was explained to the participants that the research would be about social media and mental health. Additionally, since one of the questionnaires in the study concerned PsyCap, the term was shortly explained to the reader in the informed consent form.

The study started by asking the participants to fill in their demographic characteristics, specifically, their gender, age, and nationality. Subsequently, participants filled in the MHC-SF to assess their well-being. Next, the PCQ-24 questionnaire followed, to determine the participants' degree of hope. A randomizer function in Qualtrics assigned the participants evenly to either the control condition or the experimental condition. Screenshots of the artificial posts were taken, and their originally very low number of likes were edited to be higher (see Appendix D and E). This was done to create the illusion that the artificial accounts were real people situated in a digital social environment. Furthermore, a very low number of likes could have been seen as unrealistic and the participants might have doubted the realism of the posts. In addition, the times at which the pictures were uploaded were also edited to create a more realistic design. For example, some pictures were uploaded "1 day ago" and some "2 days ago". To create an Instagram-like experience, the images were embedded in Qualtrics underneath each other so it creates the illusion of a continuous, scrollable feed (see Appendix D and E).

The control group was exposed to an Instagram feed, only including neutral posts. In the experimental condition, participants were exposed to an Instagram feed that included news posts about natural disasters due to the climate crisis from "The Guardian". After the stimuli were presented, the well-being of the participants was assessed a second time by using the

MHC-SF. Next, the participants were shortly asked to summarise the type of posts of the Instagram feed. This was done to establish whether participants paid sufficient attention to the posts presented to them.

The participants were then debriefed on what the purpose of the study was and contact information of the researchers was provided to them. Due to the prior incomplete information, participants were asked to confirm their consent a second time. If they did not agree on the final consent form, their data were excluded from the analysis. After the debriefing, the question was asked whether the participants had guessed the real purpose of the study beforehand. Lastly, the respondents were thanked for their participation.

Data analysis

IBM SPSS Statistics 28 was used as a statistical tool to analyze the data. Before the data analysis was conducted, the sample was inspected and prepared. Respondents who were underage (n = 1), had not given consent or had not filled out all questions (n = 49) were removed from the sample. Test responses which were collected before the official start of the survey were also excluded from the sample (n = 4). Frequency tables were used to inspect the results of the demographic questions.

To compute participants' well-being scores, all 14 items of the MHC-SF were summated, and the mean score was calculated. For hope, the total scores on the hope subscale were calculated. A paired sample t-test was used to inspect the difference between pre-and post-well-being scores per group. To analyze whether hope acts as a moderator on the relationship between incidental negative news exposure and well-being, the PROCESS macro v4.1 add-on by Andrew F. Hayes was used. For making judgements about statistical significance, a p-value of $p < .05$ was used as a cut-off point.

Results

In order to examine the two hypotheses, data from 211 participants were used for subsequent statistical analyses. Of the participants in this sample, 70.1% identified as female (n = 148), 28.9% as male (n = 61), and 0.9% as non-binary/third gender (n = 2) (see Table 1). The mean age of this sample was 22.50 (SD = 5.77) and more than half of the participants were German (n = 117; 55.5%). The second-largest group had a Dutch nationality (n = 45; 21.3%), and the rest indicated a different nationality (n = 49; 23.2%) (see Table 1).

Table 1

Frequencies and Descriptive Statistics for the Demographic Variables

Demographic variable	Frequencies		Descriptive Statistics	
	n	*%*	*M*	*SD*
Age			22.50	5.77
Gender				
Male	61	28.9		
Female	148	70.1		
Non-binary/third gender	2	0.9		
Nationality				
Dutch	45	21.3		
German	117	55.5		
Other	49	23.2		

Note. n = 211

Of the 211 participants, 106 (50.2%) were randomly assigned to the experimental group and 105 (49.8%) to the control group. The frequencies and descriptive statistics of both groups are depicted in Table 2.

Table 2

Frequencies and Descriptive Statistics for the Demographic Data of the Experimental and Control Group

Demographic variable	Frequencies				Descriptive Statistics			
	Experimental (n = 106)		Control (n = 105)		Experimental (n = 106)		Control (n = 105)	
	n	*%*	*n*	*%*	*M*	*SD*	*M*	*SD*
Age					22.53	6.14	22.47	5.40
Gender								
Male	30	28.3	31	29.5				
Female	76	71.1	72	68.6				
Non-binary/third gender			2	1.9				
Nationality								
Dutch	26	24.5	19	18.1				
German	55	51.9	62	59				
Other	25	23.6	24	22.9				

In addition, answers to the first control question, “Can you say in your own words what kind of Instagram posts you just saw, regarding the type of content? (Food, fitness, etc.) Feel free to use bullet points!”, were in line with what was presented to the groups. To the second control question, “Did you guess what this study was really about before seeing the debriefing? Please answer truthfully.”, 38.1% (n = 40) of the control group answered the question with “Yes” and 61.9% (n = 65) answered the question with “No” (see Table 3). In the experimental group, 62.3% (n = 66) answered the question with “Yes” and 37.7% (n = 40) answered the question with “No”.

Table 3

Answers to the Second Control Question, "Did you guess what this study was really about before seeing the debriefing? Please answer truthfully.", per Group

Group	Yes		No	
	n	*%*	*n*	*%*
Experimental [a]	66	62.3	40	37.7
Control [b]	40	38.1	65	61.9

[a] n = 106

[b] n = 105

In order to investigate the first hypothesis, a paired sample t-test was conducted for the dependent variable well-being. The results revealed a statistically significant decline between baseline (M = 3.00; SD = 0.86) and post-assessment well-being scores (M = 2.88; SD = 0.90) for the experimental group [$t(105) = 4.53$; $p < .001$] (see Table 4). In addition, a difference in well-being was observed in the control group [$t(104) = 2.42$; $p = .009$], with a statistically significant decrease between pre-assessment scores (M = 3.08; SD = 0.84) and post-assessment scores (M = 3.02; SD = 0.92).

Table 4

Paired Sample t-test Results for Well-being

Group	Baseline (T0)		Post-assessment (T1)		*t()*	*p*
	M	*SD*	*M*	*SD*		
Experimental [a]	3.00	0.86	2.88	0.90	4.53(105)	< .001
Control [b]	3.08	0.84	3.02	0.92	2.42(104)	.009

[a] n = 106

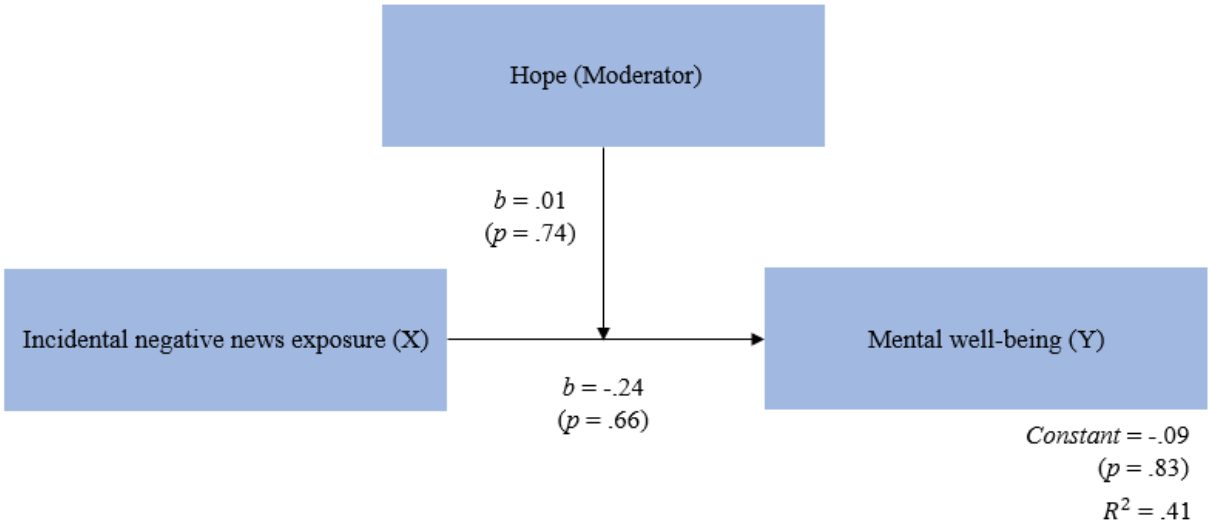
[b] n = 105

Although both groups displayed a statistically significant decline in well-being, the experimental group showed a greater decline, therefore, H1 was accepted.

Regarding the second hypothesis, a moderation analysis was employed by means of Hayes' PROCESS macro for SPSS. The analysis revealed a statistically significant model (p < .001] with an adjusted R-squared of .41 (see Figure 2). The constant was -.09 and the p-value was non-significant (p = .83). Results indicated that hope had no moderating effect on the relationship between the variables condition and well-being [b = .01; t(207) = 0.33; p = .74]. While the moderating effect was statistically non-significant, hope did have a statistically significant effect on well-being [b = .12; t(207) = 7.98; p < .001]. In addition, the results revealed no statistically significant association between condition and well-being [b -.24; t(207) = -0.44; p = .66] (see Figure 2).

Figure 2

Moderating Effect of Hope on the Relationship between Incidental Negative News Exposure and Well-being



Note. n = 211

Given this model, H2 was rejected as hope had no statistically significant moderating effect on the relationship between incidental negative news exposure and well-being.

Discussion

The aim of the current study was to investigate the effect of incidental negative news exposure on well-being. While previous studies have found evidence for the negative effects of negative news exposure on well-being, less focus has been placed on negative news exposure in the context of social media. Moreover, it should be noted that social media users are more at risk of accidentally encountering news due to the general social nature of social media and the embedded algorithms underlying certain actions (Feezell et al., 2021; Newberry, 2022; Yamamoto & Morey, 2019). In addition, some authors have suggested that through certain biases such as the negativity bias people might be more sensitive to being negatively affected by negative news compared to news with positive information (VanderWeele & Brooks, 2020). The present study provided evidence for the negative impact of incidental negative news exposure on well-being. The results from the paired sample t-test revealed two things. Firstly, well-being declined regardless of the condition. Secondly, the decline was almost twice as large in the experimental group. These findings tie well with earlier studies examining the role of social media on well-being. Specifically, prior research has provided evidence for the negative direct and indirect effects of social media use on well-being (Foroughi et al., 2021; Nagar & Virk, 2017; Tiggemann et al., 2018; Woods & Scott, 2016). Moreover, studies focusing on Instagram exposure demonstrated that Instagram is linked to negative mental health outcomes such as depression, (social) anxiety, low life satisfaction, and body dissatisfaction (Foroughi et al., 2021; Tiggemann et al., 2018; Nagar & Virk, 2017; Woods & Scott, 2016). Thus, it has been shown that social media exposure is harmful to users' well-being, which could explain why a significant decline was found in both groups.

Furthermore, participants in the experimental group demonstrated a greater decline in well-being. The negative news posts might have triggered adverse reactions due to the

cognitive bias associated with negative content (VanderWeele & Brooks, 2020). Moreover, news containing negative information has previously been found to reduce levels of well-being and negatively influence affective states (Bodas et al., 2015; Jain, 2021; McIntyre & Gibson). By combining these results, it can be suggested that exposure to social media has an overall negative impact, but that incidental negative news exposure can increase this negative effect. Despite these findings, it should be noted that the Hayes' PROCESS macro model did not reveal a statistically significant association between incidental negative news exposure and well-being. The absence of a direct link might be explained by potential, additional factors influencing this relationship. Specifically, the effect of incidental negative news exposure on well-being might have become non-significant due to a third variable. For example, exposure to negative news is associated with negative psychological outcomes such as anxiety and distress (Jain, 2021; Johnston & Davey, 1997). In addition, prior studies have reported that news containing stories about COVID-19, terrorism, disasters, and violence predicted anxiety and fear of these crises or problems, which, in turn, had implications for someone's overall well-being and mental health (Fabio & Suriano, 2021; Hopwood & Schutte, 2017; Nellis & Savage, 2012). Future research should consider introducing a mediating variable to confirm the idea that well-being might have been indirectly influenced by incidental negative news exposure via a third variable such as anxiety or fear.

The current study also examined whether levels of hope could moderate the relationship between incidental negative news exposure and well-being. Hope has namely been found to evoke positive emotions, and aid in coping with stress and emotion regulation (Hellman et al., 2014). Evidence showed that people with high levels of hope are more satisfied with life and experience higher levels of well-being (Hellman et al., 2014; Magaletta & Oliver, 1999). Given these facts, it was assumed that in cases where participants displayed higher levels of hope, their well-being would be less negatively affected compared to

participants with lower levels of hope. Despite these expectations, hope had no moderating effect on the relationship between incidental negative news exposure and well-being. The results might have been affected by the fact that the majority of participants belonged to the younger population. Although age differences have not been analysed, adolescents and young adults might not have fully developed the cognitive skills necessary to think hopeful (Marques & Gallagher, 2017). This appeared to be the case in a study conducted by Marques and Gallagher (2017) who found that people reach their peak stability in hope in their adulthood. In addition, hope levels were found to be higher in adults (30-45 years and 46-64 years) than in the younger population (15-17 years and 18-29). Adolescents and young adults might not have sufficiently developed the cognitive skills related to hope, however, as people reach adulthood, they become more capable of efficiently and consistently applying these cognitive skills (Marques & Gallagher, 2017). Thus, age might have affected the results of this study, but further research is needed to support this claim. Another potential reason why no moderation effect was observed is that no association was found between incidental negative news exposure and well-being in the first place. In addition, it can be suggested that hope is not sufficient to moderate the association between incidental negative news exposure and well-being, but other factors could potentially have an influencing role. For example, hope can be perceived as a component of Psychological Capital (PsyCap) and although this study did not demonstrate a moderating effect of hope, the other components (self-efficacy, resilience, and optimism) or a combination of these traits could have yielded different outcomes (Tunney et al., 2021). Also, it should be acknowledged that hope was associated with well-being, so a more complex relationship is not unlikely to be found.

Limitations, strengths and future research

Furthermore, there were some limitations related to this study. Despite the adequate sample size, some variation within the sample was lacking, thereby it is not representative of the general population. Specifically, the sample was narrowed down to a younger population. A possible reason is that convenience sampling was employed in this study. Participants were recruited via the SONA system of the University of Twente and the researchers' social environment. Nonetheless, this sample does essentially represent the general Instagram audience, as young adults make up the biggest group of Instagram users (Statista Research Department, 2022). However, this also raises questions as to whether different results would have been found using different social media platforms. In particular, platforms that attract older generations such as Facebook and YouTube (Pew Research Center, 2021). In addition, Instagram has been found to be contextually different from Facebook and Twitter (Voorveld et al., 2018). Instagram users are more inclined to use Instagram for entertainment needs, whereas Facebook and Twitter users surf through these platforms to stay informed and up-to-date. The latter platforms have also been linked to more negative emotions, which may aggravate levels of well-being (Voorveld et al., 2018). These findings could serve as input for future studies where the outcomes of incidental negative news exposure on Twitter and Facebook can be explored. Another point in terms of variation is the larger female population. As we did not compare gender differences, it is not clear whether gender influenced the results. However, it has appeared in the past that women are more vulnerable to social media exposure and overall experience greater negative consequences than men (Booker et al., 2018; Nagar & Virk, 2017). However, future research is needed to confirm whether this also relates to incidental negative news exposure on social media. Ideally, this study could be replicated, and additional hypotheses could be explored by using independent t-test analysis, for example, to test for gender differences. Replication is also possible due to the adequate

measurement properties found for both scales. This study found high internal reliability for both the MHC-SF, and the PCQ-24 and the adjusted subscale, which is consistent with prior studies (Lamers et al., 2011; Liran & Miller, 2019). However, the present study did not re-validate either scale with additional analysis such as factor analysis. Moreover, since the PCQ-24 was adapted and, consequently, measured Psychological Capital in a broader context, future researchers are recommended to validate the adapted scale.

Furthermore, the points of measurement lay close to each other, implying that only the short-term effects of exposure were measured. Nonetheless, there is evidence for negative long-term effects of negative news exposure, in particular, news exposure in a time of crisis can have detrimental consequences (Silver et al., 2013). For example, a longitudinal study explored the physical and psychological consequences of traumatic news exposure during the 9/11 period (Silver et al., 2013). Exposure to news related to 9/11 left people mentally and physically affected even 3 years after the traumatic event (Silver et al., 2013). The possibility of these long-term outcomes could be further investigated in future research. Furthermore, by reconsidering the design of the Instagram feed, there are some features that could be changed in order to create a more realistic simulation. While there were some strong points to the design such as that multiple posts from different accounts were included, likes and times at which the pictures were uploaded differed, and pictures were placed underneath each other to match the real Instagram layout, there were also some notable flaws. In reality, Instagram is more interactive and allows people to like, share and move through pictures. Users can also watch videos and take photos in the application. By adding these basic features to the study design it could enhance a realistic experience and, as a result, participants would feel more familiar with the Instagram feed. In addition, the placement of the negative news images might have affected post-well-being scores. In the experimental condition, one of the two negative images was placed at the end of the feed, which might have caused a cognitive bias

in participants. In literature, this bias is referred to as the recency effect and explains why "recent" information is better remembered (Ross, 2009). As a result, participants in the experimental group might have been more influenced than if the posts were placed in the middle of the feed, for example.

Finally, particular attention should be placed on the answers given to the second control question as some answers were difficult to interpret. Specifically, some control group participants answered “Did you guess what this study was really about before seeing the debriefing? Please answer truthfully.”, with “Yes”. This is confusing as their process did not go beyond the controlled condition so they could not know what the study was about. Possible reasons for these answers could have been reluctance, unknowingness, or misunderstanding of the question. It should also be noted that a warning message popped up before the control question appeared, which may have caused confusion in some of the participants. Another point to consider is that more than 100 participants were from the SONA system of the University of Twente. Their academic background could have led them to think that there were more variables and conditions than just a “social media” condition, thereby considering themselves to be in the control condition. Running the study with a non-academic population might have led to more control group participants answering the question with “No”. The other situation could have been more desirable as non-academic participants would have had a less biased view on the study and probably would have been less likely to assume that there are more variables or conditions related to this study. In this study, all cases were accepted for data analysis as the answers were assigned to the misleading study layout, but this is a point to take into consideration while preparing the data or even establishing criteria in the future. Although answers to the second control question were difficult to interpret, answers to the first control question might provide more insight. Specifically, in order to participate in the study, participants had to meet two criteria, namely, they had to be 18 years or older and had

to have sufficient English skills. Participants had to indicate this for themselves based on self-evaluation. Consequently, it was not guaranteed that participants were honest. Nonetheless, by analysing the answers given to the first control question, “Can you say in your own words what kind of Instagram posts you just saw, regarding the type of content? (Food, fitness, etc.) Feel free to use bullet points!”, it became clear that participants did have sufficient understanding as answers were in line with the actual content of the Instagram feeds. Therefore, it can be recommended to incorporate open questions in future surveys as answers can give more clarity on participants’ competency.

Practical implications

Furthermore, this study may have implications for the design of future policies and interventions promoting well-being among social media users. The findings provide insight into the influence of incidental negative news exposure on well-being. Recently, Instagram has introduced a new feature called the sensitive content control, which protects users from viewing offensive or disturbing content and, consequently, aids in creating a safer online environment (Hu, 2021). Posts containing negative content are covered with a warning message and can only be opened when the user actively agrees to view the picture or video. Given the negative effect of incidental negative news exposure on well-being, users could also benefit from protection on these kinds of posts, especially, because of the active element. As users are informed by the warning message about the possible sensitive content, hence, become more conscious, the incidental aspect of the exposure fades away. Thus, by also applying the sensitive content control feature to incidental negative news posts, users’ well-being might be protected as they are not directly exposed to negative content.

Conclusion

This is one of the first studies examining the effect of incidental negative news exposure on well-being in the context of social media. Evidence showed that social media may have an overall negative impact on well-being, but that this negative effect is greater when confronted with incidental negative news. This is consistent with prior studies on the consequences of negative news exposure. However, it is not yet clear whether other factors influenced this relationship. Therefore, future research could consider introducing mediating variables such as anxiety, fear, or stress, in order to clarify the conflicting findings. In addition, this study did not demonstrate a moderating effect of hope, which possibly could be explained by the age difference observed in the sample. In order to confirm this, the present study could be replicated and additional analyses could be conducted. Overall, these findings contribute to future research and could also have implications for the design of social media policies and interventions to protect users' well-being.

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Appendices

Appendix A

Informed Consent Form as Embedded into Qualtrics

Q1
Dear participants, The goal of this study is to identify the relation between social media and wellbeing.

The researchers are Bachelor Psychology students at the University of Twente in Enschede, Netherlands. This research aims as a graduation assignment.

The study will take approximately 15 minutes to complete. It includes questions concerning wellbeing as well as aspects of psychological capital. Psychological capital is a resource a person can make use of to cope with adverse situations.

Participating in this study is completely voluntarily. You can withdraw from it at any time, which will have no negative consequences for you. Your data will be treated anonymously and confidentially and is used for study purposes only. The data we use for our report cannot be tracked back to you. All data collected will be deleted once the study process is finished.

If you have questions concerning this study or are interested in gaining insights into the results, please feel free to contact us via E-Mail. Thank you for your participation!

Kind regards,

(Contact information from the researchers have been removed due to privacy regulations)

I consent to my participation in this study

- Yes, I consent (1)
- No, I do not consent (2)

Skip To: End of Survey If Dear participants, The goal of this study is to identify the relation between social media and we... = No, I do not consent

Appendix B

Demographic Questions as Embedded into Qualtrics

Q4 What is your nationality?

- Dutch (1)
- German (2)
- Other, namely... (3) _____

Q5 With what gender do you identify as?

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)

Q6
What is your age?

_____

Appendix C

MHC-SF and PCQ-24 as Embedded into Qualtrics

Q2 First, we will ask you some questions regarding how you see life. Please try to answer as truthfully as possible.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Somewhat Agree (4)	Agree (5)	Strongly Agree (6)
I feel confident analyzing a long-term problem to find a solution. (1)	○	○	○	○	○	○
I feel confident in representing my work or school in official meetings. (2)	○	○	○	○	○	○
I feel confident contributing to discussions. (3)	○	○	○	○	○	○
I feel confident to set targets / goals in life. (4)	○	○	○	○	○	○
I feel confident contacting people to discuss problems. (5)	○	○	○	○	○	○
I feel confident presenting	○	○	○	○	○	○

information to a group of people. (6)						
If I should find myself in a jam in life, I could think of many ways to get out of it. (7)	○	○	○	○	○	○
At the present time, I am energetically pursuing my life goals. (8)	○	○	○	○	○	○
There are lots of ways around any problem. (9)	○	○	○	○	○	○
Right now, I see myself as being pretty succesful in life. (10)	○	○	○	○	○	○
I can think of many ways to reach my current life goals. (11)	○	○	○	○	○	○
At this time, I am meeting the life goals that I have set for myself. (12)	○	○	○	○	○	○
When I have a setback in my life, I have	○	○	○	○	○	○

trouble recovering from it, moving on. (13)						
I usually manage difficulties one way or another. (14)	○	○	○	○	○	○
I can be "on my own", so to speak, if I have to. (15)	○	○	○	○	○	○
I usually take stressful things in life in stride. (16)	○	○	○	○	○	○
I can get through difficult times because I've experienced difficulty before. (17)	○	○	○	○	○	○
I feel I can handle many things at a time in life. (18)	○	○	○	○	○	○
When things are uncertain for me, I usually expect the best. (19)	○	○	○	○	○	○
If something can go	○	○	○	○	○	○

wrong for me in life, it will. (20)						
I always look on the bright side of things regarding life. (21)	○	○	○	○	○	○
I'm optimistic about what will happen to me in the future. (22)	○	○	○	○	○	○
Things never work out the way I want them to. (23)	○	○	○	○	○	○
I approach life as if "every cloud has a silver lining." (24)	○	○	○	○	○	○

Q3
The next couple of questions concern your well-being. Again, please try to answer as truthfully as possible.

During the past month, how often did you feel...

	Never (1)	Once a week (2)	About once a week (3)	About 2 or 3 times a week (4)	Almost every day (5)	Every day (6)
Happy (1)	○	○	○	○	○	○
Interested in life (2)	○	○	○	○	○	○
Satisfied with life (3)	○	○	○	○	○	○
That you had something important to contribute to society (4)	○	○	○	○	○	○
That you belonged to a community (like a social group, or your neighborhood) (5)	○	○	○	○	○	○
That our society is becoming a better place, for all people (6)	○	○	○	○	○	○
That people are basically good (7)	○	○	○	○	○	○
That the way our society works makes sense to you (8)	○	○	○	○	○	○
That you liked most parts of your personality (9)	○	○	○	○	○	○

Good at managing the responsibilities of your daily life (10)	○	○	○	○	○	○
That you had warm and trusting relationships with others (11)	○	○	○	○	○	○
That you had experiences that challenged you to grow and become a better person (12)	○	○	○	○	○	○
Confident to think or express your own ideas and opinions (13)	○	○	○	○	○	○
That your life has a sense of direction or meaning to it (14)	○	○	○	○	○	○

Q9 You will now see an Instagram feed. Spend some time to look at each of the posts, their captions and comments.

Appendix D

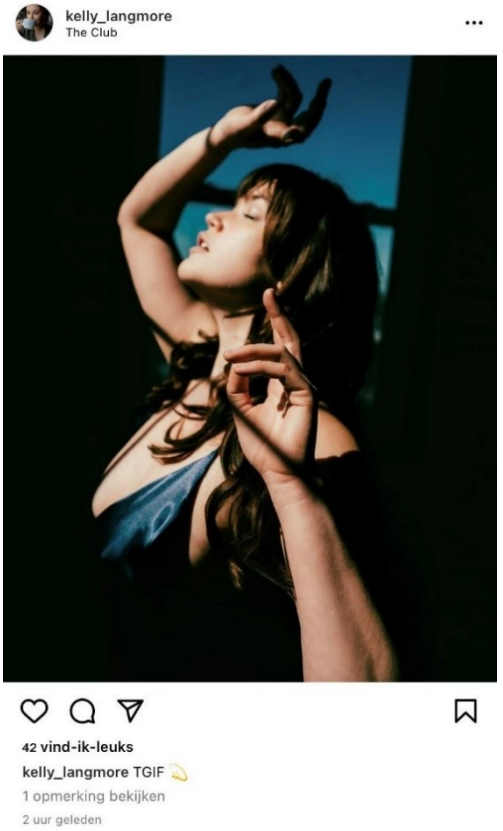
Instagram Feed (Control Condition)

lisi_sunni
Den Haag City
kelly_langmore en anderen vinden dit leuk
lisi_sunni my wallet is crying but my heart is happy ;D
itswyattsnell Looks like it's time for a photo shoot?
kelly_langmore Wooow so pretty!!
1 dag geleden · Vertaling weergeven

carlo_travel
juliaa_baauer en 50 anderen vinden dit leuk
carlo_travel
#hiking #waterfall #nature
1 dag geleden · Vertaling weergeven

itswyattsnell
kelly_langmore en 321 anderen vinden dit leuk
itswyattsnell My sister Ruth got married last week! Thanks for having me as your wedding photographer. It was my honor.
lisi_sunni ruth and ben are the cutest together <3
itswyattsnell @lisi_sunni They really are.
kelly_langmore
27 vind-ik-leuks
kelly_langmore Treated myself during my morning walk. #iscreamforicecream #delish
2 dagen geleden · Vertaling weergeven

lisi_sunni
Den Haag
kelly_langmore en anderen vinden dit leuk
lisi_sunni jullie zijn geweldig <3 weekendje in den haag
#lekkermetdemeidenmeidenmeiden
1 dag geleden
itswyattsnell
kelly_langmore en 254 anderen vinden dit leuk
itswyattsnell Office days.
lisi_sunni coffee first :D
itswyattsnell @lisi_sunni Haha! Damn right.
1 dag geleden · Vertaling weergeven


kelly_langmore
The Club
42 vind-ik-leuks
kelly_langmore TGIF
1 opmerking bekijken
2 uur geleden

lisi_sunni
Nijmegen
kelly_langmore en anderen vinden dit leuk
lisi_sunni spring vibes <3
itswyattsnell Nice photo composition.
1 dag geleden · Vertaling weergeven

Appendix E

Instagram Feed (Experimental Condition)

lisi_sunni
Den Haag City
kelly_langmore en anderen vinden dit leuk
lisi_sunni my wallet is crying but my heart is happy ;D
itswyattsnell Looks like it's time for a photo shoot?
kelly_langmore Wooow so pretty!!
1 dag geleden · Vertaling weergeven

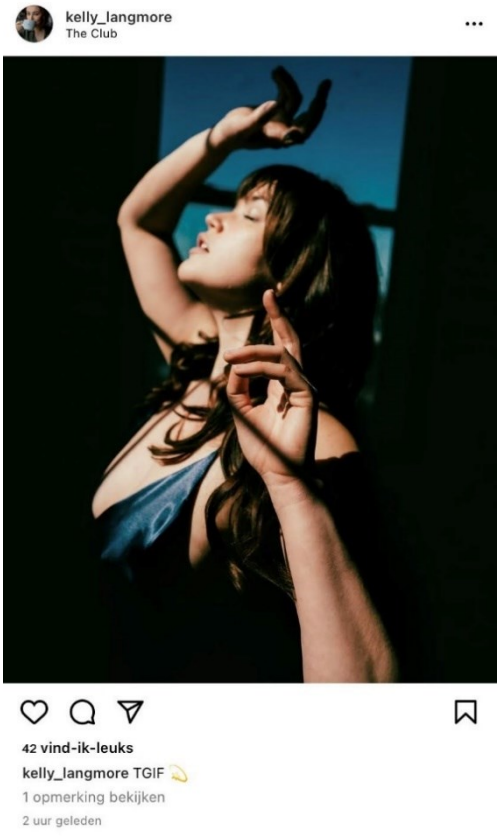
guardian
Only rapid and drastic action in next decade can prevent climate catastrophe
Swipe to understand the damning climate report on the 'irreversible' changes humans have caused
40.865 vind-ik-leuks
guardian As a verdict on the climate crimes of humanity, the new Intergovernmental Panel on Climate Change report could not be clearer: we're guilty as hell.
The repeatedly ignored warnings of scientists over past decades have now become reality. Humanity, through its actions, or lack of action, has unequivocally overheated the planet. Nowhere on Earth is escaping rising temperatures, worse floods, hotter wildfires or more searing droughts.
The future looks worse. "If we do not halt our emissions soon, our future climate could well become some kind of hell on Earth," says Prof Tim Palmer at the University of Oxford.
So what do we need to know about the IPCC's most damning report to date - and what needs to come next? Swipe to read more.

carlo_travel
juliaa_baauer en 50 anderen vinden dit leuk
carlo_travel
#hiking #waterfall #nature
1 dag geleden · Vertaling weergeven
itswyattsnell
kelly_langmore en 321 anderen vinden dit leuk
itswyattsnell My sister Ruth got married last week! Thanks for having me as your wedding photographer. It was my honor.
lisi_sunni ruth and ben are the cutest together <3
itswyattsnell @lisi_sunni They really are.

kelly_langmore
27 vind-ik-leuks
kelly_langmore Treated myself during my morning walk.
#iscreamforicecream #delish
2 dagen geleden · Vertaling weergeven

lisi_sunni
Den Haag
kelly_langmore en anderen vinden dit leuk
lisi_sunni jullie zijn geweldig <3 weekendje in den haag
#lekkermetdemeidenmeidenmeiden
1 dag geleden

itswyattsnell
kelly_langmore en 254 anderen vinden dit leuk
itswyattsnell Office days.
lisi_sunni coffee first :D
itswyattsnell @lisi_sunni Haha! Damn right.
1 dag geleden · Vertaling weergeven


kelly_langmore
The Club
42 vind-ik-leuks
kelly_langmore TGIF
1 opmerking bekijken
2 uur geleden

lisi_sunni
Nijmegen
kelly_langmore en anderen vinden dit leuk
lisi_sunni spring vibes <3
itswyattsnell Nice photo composition.
1 dag geleden · Vertaling weergeven

guardian
Climate crisis
Extreme weather across the world in 10 photos
82.459 vind-ik-leuks
guardian The Earth is changing faster than at any point in human memory as a result of human-caused global heating.
From extreme heat and wildfires to devastating flooding as well as drought, our picture desk has collated a series of photos documenting how severe weather conditions have been affecting so many of us in the last six months.
Swipe through to see 10 of the most powerful images, and tap the link in bio to view Joe Plimmer's full 50 photograph selection.

Appendix F

Second Display of the MHC-SF and First Control Question as embedded into Qualtrics

Q7
We would like you to fill out the questions about your well-being again.

During the past month, how often did you feel...

	Never (1)	Once a week (2)	About once a week (3)	About 2 or 3 times a week (4)	Almost every day (5)	Every day (6)
Happy (1)	○	○	○	○	○	○
Interested in life (2)	○	○	○	○	○	○
Satisfied with life (3)	○	○	○	○	○	○
That you had something important to contribute to society (4)	○	○	○	○	○	○
That you belonged to a community (like a social group, or your neighborhood) (5)	○	○	○	○	○	○
That our society is becoming a better place, for all people (6)	○	○	○	○	○	○
That people are basically good (7)	○	○	○	○	○	○
That the way our society works makes sense to you (8)	○	○	○	○	○	○
That you liked most	○	○	○	○	○	○

parts of your personality (9)						
Good at managing the responsibilities of your daily life (10)	○	○	○	○	○	○
That you had warm and trusting relationships with others (11)	○	○	○	○	○	○
That you had experiences that challenged you to grow and become a better person (12)	○	○	○	○	○	○
Confident to think or express your own ideas and opinions (13)	○	○	○	○	○	○
That your life has a sense of direction or meaning to it (14)	○	○	○	○	○	○

Q35
Can you say in your own words what kind of Instagram posts you just saw, regarding the type of content? (Food, fitness, etc.)
Feel free to use bullet points!

_____

Appendix G

Debriefing Form and Second Control Question

Q8
Debriefing

Dear participants, In the beginning of this study, we indicated that we were interested in identifying the relationship between social media and well-being. However, that information was incomplete.

We were also investigating incidental negative news exposure, which is the process of being confronted with negative news without expecting it or wanting it. It has been connected to increased stress and other negative effects on mental health in research. This is why the experimental group of this research was also shown screenshots of news posts about climate change. If you were part of the control group, you only saw Instagram posts of fictional people.

Additionally, we asked you questions about how hopeful, resilient etc. you are. The aim behind this was to see whether someone with a lot of hope is less affected by incidental negative news exposure. We apologize for any distress the climate-change-related posts might have caused for you.

Again, we would like to offer you the opportunity to reach out to us if you would like to share something with us or ask a question. Here are our email addresses:

(Contact information from the researchers have been removed due to privacy regulations)

Please indicate whether you still consent to being part of this study, knowing the complete information now.

- o I confirm my consent. (1)
- o I do not consent anymore. (This will terminate your participation) (2)

Skip To: End of Survey If Debriefing Dear participants, In the beginning of this study, we indicated that we were intereste... =

Q58
Information to those wo do not access this study through University of Twente's SONA-System: You will likely see an error screen after clicking further, but this is not a problem. Your data will be saved and all is fine. :)

Did you guess what this study was really about before seeing the debriefing? Please answer truthfully.

- Yes (1)
- No (2)

Appendix H

Modified Version of the PCQ-24

1. **I feel confident analyzing a long-term problem to find a solution.**
2. I feel confident in representing my work or school area in official meetings
3. I feel confident contributing to discussions.
4. I feel confident helping to set targets/goals in life.
5. I feel confident contacting people to discuss problems.
6. I feel confident presenting information to a group of people.
7. If I should find myself in a jam in life, I could think of many ways to get out of it.
8. At the present time, I am energetically pursuing my life goals.
9. **There are lots of ways around any problem.**
10. Right now, I see myself as being pretty successful in life.
11. I can think of many ways to reach my current life goals.
12. At this time, I am meeting the life goals that I have set for myself.
13. When I have a setback in my life, I have trouble recovering from it, moving on.
14. I usually manage difficulties one way or another in life.
15. I can be “on my own,” so to speak, if I have to.
16. I usually take stressful things in life in stride.
17. I can get through difficult times because I’ve experienced difficulty before.
18. I feel I can handle many things at a time in life.
19. When things are uncertain for me, I usually expect the best.
20. If something can go wrong for me in life, it will.
21. I always look on the bright side of things regarding life.
22. I’m optimistic about what will happen to me in the future.
23. In life, things never work out the way I want them to.
24. I approach life as if “every cloud has a silver lining.”